the education of the wealthy classes of the community, that the landed and professional classes have been educated apart from the commercial and industrial classes, to the very great injury of both."

This is the reason that the true condition of things has not been appreciated long ago. It is not understood, and therefore it is not believed. Our political leaders, the permanent chiefs of the various public departments, have not the slightest idea what all this fuss is about, because their education has been entirely apart from those regions of thought and work in which in the future the peaceful battles of the world will be fought and won; if not by us, then by others, for fighting there must be.

No better argument could be found for the establishment of a ministry and council of science than was afforded by two speeches delivered some little time ago by the Duke of Devonshire on matters connected with scientific education, and of which condensed reports were given in NATURE at the time. The Duke candidly confessed at Birmingham that he was not placed at the head of the educational and scientific affairs of the country on account of any special knowledge of the subjects, for "his knowledge of science and art could be compressed into two nutshells." It is not our desire to utter one word against the Duke of Devonshire for his candour; he has shown that he is interested in technical education, and has on more than one occasion assisted the work of science. But what we do criticise is the political system which does not consider it necessary that the educational and scientific welfare of the country should be the business of those who are able to appreciate the work done, to see the necessity of reforms, and to know the directions in which developments should take place. In almost every other country the State or Government has official men of science among its servants, and also constantly ask the advice and assistance of their academies and learned societies, when questions of technical and scientific interest are being discussed; but here no such use is made, either of the societies as a whole or of the men who constitute them.

CARL VOGT.

La Vie d'un Homme: Carl Vogt. By William Vogt. 4to vol. of 264 pages, with two portraits by Otto Vautier. (Schleicher Brothers, *ex*-Reinwald. Paris, 1896.)

A PHILOSOPHER he was—there is no doubt about that; but none of the quiet sort who "leave controversy to the little world below them": he was one of the fighting portion, and while none have known him to step out of his path to avoid a skirmish, he has often gone far from his track for the mere pleasure of picking up some battle. To him life was movement, and a true account of his years should include more than the history of his scientific work. The latter has been reviewed in NATURE for May 30, 1895, and a very full account thereof has been also given by his pupil and friend, Emile Yung, in *Revue Scientifique*, dated June 22, 1895. M. William Vogt, his son, now proceeds to tell us the essentials of his life; and although the large book before us deals but slightly with the scientific features of the lamented naturalist, still scientific readers will find much in it to interest them, in the way of anecdotes concerning Vogt's relations with men of his time, and letters of the latter.

Carl Vogt was born on July 5, 1817, at Giessen, in Germany, the eldest of nine children. Celtic blood was predominant in his veins, not Germanic, and much in his character and wit was distinctively Celtic. The son of a distinguished physician and professor, Carl had an uneventful youth. To put it short, he was lazy, and Gall could certainly not locate the "bump of respect" or of submissiveness on that head. His father was assured that the masters allowed him to pass from class to class, each year, only to get rid of this turbulent and undisciplined pupil; and it is well known that the aforesaid "bump" never grew. After the school-days, Carl was sent to the medical faculty, where he did more fighting and duelling than reading or study, and entered Liebig's laboratory. He was engaged in an investigation of the amniotic liquid (published in Müller's *Archiv*, 1837), when an event occurred which stands at the basis of all Vogt's political troubles. A law student, implicated in the Marburg plot, and a republican, begged of Vogt to help and conceal him, as the police were in search of him. Vogt—a nephew of the three republican brothers Follenius—complied immediately, and hid his fellow-student in his own room, although the next day it was officially announced that five years' imprisonment in a fortress was the penalty for such offence. A week elapsed, quietly, when one day, Liebig took Vogt aside. Liebig knew the facts, and had heard that the police also were informed; it was high time for Vogt to run. At once Vogt went home, and the same evening the refugee and himself left, in opposite directions, early enough to avoid being captured. Carl Vogt fled to an uncle of his, near Darmstadt, and spent a few weeks there, disguised by his uncle—an inspector of forests—as a forest official, and in this character taking part in the chases of the very *Gross-Herzog* himself, whose police were after Vogt. Some weeks later, he managed to cross the Rhine, and, with the help of friends, to put his feet on the French soil; he was then out of trouble. His father desired him to pursue his medical studies, and in 1839 he graduated in Bern *maxima cum laude.* But little he cared about medical art. Valentin, the physiologist and anatomist, had been interested in the young student, and wished to bring him over to zoology and physiology. Vogt took very kindly to the hints, and to Valentin's lessons, and undertook most willingly to investigate the nervous system of some South American reptiles collected by Humboldt. Hence two papers ("Neurologie von Python tigris" and "Neurologie der Reptilien," 1839-40) which are the first anatomical work of Carl Vogt, the last being more than fifty years younger. At this period, circumstances—too long to relate—put Vogt, and Edouard Desor his friend, in contact with Louis Agassiz, and they decided of Vogt's scientific future: he was bound to become a naturalist. Vogt set to work in most determined manner at Agassiz's "Poissons d'Eau douce" and at the "Embryologie des Salmonés," publishing in the meantime his interesting paper on "Alytes obstetricans." An amusing anecdote finds its place here. One day Desor, while dictating to a young *famulus* a sentence, said, in order to surprise him: "This specimen is distinguished from others (other fishes) by this characteristic, that it has the head where the others have the tail." The *famulus* never winced. The copy went to the printing-house, and the proofs came in due time. But the wonder is that, while Desor, Vogt, and Agassiz—*deus ipse*—went over the proofs and corrected them, none noticed the absurd sentence, and it is only after fifty copies had been printed off that Desor remembered his "little joke," and stopped the proceedings. Let writers be lenient towards printers and proof-readers; such is the moral of this story.

At the same time, Agassiz, aroused to the interest of glacial studies by Venetz and Jean de Charpentier, began his historical fight against Elie de Beaumont and von Buch, and, in order to settle the matter, decided to investigate glaciers thoroughly. Thus originated the Hotel des Neuchatelois expedition, when Agassiz, Desor, and Vogt settled on the Aar glacier, and made a sort of cabin under a huge boulder which had fallen from the Schreckhorn, and upon which the names of the party were scratched, still legible, in part, a few years ago. Two summers were spent there in great activity; the "Agassiz factory," as not over-respectful Vogt used to call the association, being under its highest pressure. The Neuchatel period had its outcome—as far as Vogt alone is concerned—in the publication of "Im Gebirg und auf den Gletschern," studies on the fauna of red snow, and a severe discussion with von Buch. The latter was not convinced, but bore no grudge towards the young "Mutz" ("Mutz" is Bernese *patois* for bear, a surname given to Vogt by his friends) for his attacks, and even allowed that "aus dem kerl wird noch etwas werden."

Vogt and Agassiz were not to agree very long. To ascertain the exact cause of their estrangement would prove perhaps difficult. Ernst Haeckel has been very clear and positive on one point, however, and he denounces Agassiz as having been "the most active and clever *chevalier d'industrie* who ever worked in the field of natural history," "clever" being taken in its none too favourable sense.

Agassiz seems to have practised *Ich nehm es mit* on a large scale, taking an unfair advantage of his younger co-operators, and not giving them the credit which was due to them for their share of the work. Carl Vogt and Desor accordingly retired, and the scientific partnership of the Hôtel des Neuchatelois was dissolved. This was in 1844. Paris could hardly fail to attract Vogt, and thither he directed his steps. His friends, or masters, were Ehrenberg, the revolutionist Bakounine, von Baer, Quételet, Arago, Milne-Edwards, Leverrier, de Jussieu, and many others of equal fame. Three years were spent then, at hard work. Vogt published his investigations on the development of gasteropods, and his "Lehrbuch der Geologie und Petrefactenkunde." The latter, but little known in England or in France, was much appreciated in Germany, and much read; many editions were brought out, always kept *au courant*. The last is dated 1879. In Paris also he wrote his celebrated "Physiologische Briefe," of which Russian, German French, and Italian versions are extant. The book was as loudly praised as heartily denounced. A year ago, still, a Catholic writer compared Vogt to a "murderer" for having written it, and so clearly spoken out his materialistic creed. There is no doubt as to Vogt's sincerity, but doubt may be entertained as to the necessity of some pages in his otherwise very interesting and spirited book. "The philosopher must station himself in the middle," said Goethe. Vogt was by nature extreme. On the other hand, it must be confessed that the much-abused sentence, "Thought is about in the same relation to brain, as bile to liver, or urine to kidney," is one that no physiologist can refuse to endorse, as long as he stands only on the solid ground of facts as at present ascertained.

To the same period of life belongs "Ocean und Mittelmeer," a descriptive narrative of excursions to the seashore, mingled with scientific facts. During his summer vacations, Vogt travelled on the Mediterranean coast, and while the picturesque scenery and pleasant climate of the sun-bathed shores strongly appealed to the intense feeling of the lover of nature, the naturalist was attracted by the rich and varied fauna; he therefore decided, *hic et nunc*, to pursue his investigations; Nice was even better than Paris. Here was performed most of the work which ended in the publication of many papers on Cephalopods (with Vérany), on Siphonophora, and Ascidians. In 1846, kind Liebig, who had kept an attentive eye on his former pupil's doings, wrote to offer him a position. The Giessen University was to have a chair of Zoology; would he come and fill it? Certainly, answered Vogt. But there were difficulties. The Government was—for reasons of old, already told—no friend to the republican "Mutz," whose "Physiologische Briefe" were to many a permanent scandal; and Liebig's proposal would have been rejected, had it not been for old von Buch's and Humboldt's personal intervention. Agassiz also helped actively, and in 1847 Carl Vogt, the police-tracked student of 1837, entered Giessen as Professor of Zoology. It would seem that the *wanderjahre* were now over, and that the hot-headed young man was to settle down quietly in his chair, to grow fat and bald, and conservative, and optimistically smile upon the world, sitting down and doing nothing, or little. Such is often the case; but with Vogt, otherwise.

His first act was a scandal to the peaceful community of Giessen: he refused to shave, as university professors were required to. And then, 1848 was approaching; the storm was brewing, and how could Vogt not be attracted by the prospective trouble? A member of the dissolved *Vorparlament*—all this story cannot be abridged, so it is simply omitted—Carl Vogt was re-elected as antagonistic to the Conservative Government, and during a few days he was one of the *Reichs-regents*—part of an emperor. But the republicans were crushed by superior forces, and the revolution was checked. Vogt had to take leave—his chair was handed over to Rudolph Leuckart—and he sought a refuge in Switzerland, and shortly after in Nice. Politics were, for the time being, dismissed, and zoology again carried the day. At least, *Bilder aus dem Thierleben*, and papers on different invertebrata of the coast, went to show so much, followed by *Untersuchungen über Thierstaaten;* but even here, Vogt managed to intersperse political allusions in biological descriptions: an unnecessary feature, to speak the truth. His innate aggressiveness had again the best of him. A year or two passed, when he received from Geneva the proposal of a botanical chair. Vogt, not feeling qualified, declined. Well, would he accept a chair of Geology and Palæontology? Willingly: and now, at last, Vogt "settled." He became a Swiss citizen, and from 1856 to the day of his death, played a not unimportant *rôle* in Swiss politics, having been repeatedly elected to the highest councils of State. He was one of the founders of the *Institut National Genevois*, and while duly attending to his professorial duties, he took an active part in the more important political and scientific discussions or quarrels of the time. He was one of those who before the sixties, ardently advocated the creation of zoological marine stations; nor could he fail, when the "Origin of Species" was thrown on the world, to become an admirer and supporter of the new theory. The principal events of his life may now be rapidly noticed. In 1861, he travelled north and visited Norway, Jan Mayen, Iceland, publishing an account of his excursion in 1862 under the title "Nord-Fahrt entlang der Norwegischen küste," &c.; in 1863, were published "Vorlesungen uber den Menschen"—translated in English, French, Italian, Spanish, Russian, Polish, Hungarian—much read, much abused, but also much approved in spite—or because—of the burning ground which they covered; and the interest Vogt took there and then in prehistoric archæology was the cause of his investigations on anthropology, later embodied in different papers: "Ueber die fossilen Menschenschädel der Diluvialbildung," "La Machoire humaine de Naulette," "Le Crane du val d'Arno." His "Vorlesungen über schädliche und nützliche Thiere" were published at about the same time. In 1865–66 he issued his important "Mémoire sur les microcéphales ou Hommes-Singes," where he considered microcephaly as a return to the condition of man's ancestor—a view much opposed by Virchow, while no definite conclusion can be said to have yet obtained. From 1867 or 1869 he wrote little, but spoke much. At that time he travelled in Germany delivering lectures on the origin of man and the Darwinian theory. "Affenvogt"—monkey-Vogt, as he was nicknamed by the people, had occasionally a hard time of it. One evening, while he was lecturing, some stones crashed through the window. "I was talking yesterday evening, gentlemen," says Vogt, picking up one of the missiles, "I was talking of our savage ancestors of the Stone age: you may perceive now, that this age is not entirely a thing of the past." And Broca, writing to him about his book on useful and injurious animals, could rightly say: "Vogt, there are many beasts in this world and of the most injurious, of which you have said nothing." . . .

Vogt's life is so very full, that it is hard to even mention its principal phases. In 1872–74 we find him actively engaged in the task of creating a medical school—a university—in Geneva, and in 1875 he succeeds, having played a very prominent part therein; at the same time he publishes his "Atlas der Zoologie," translates Gegenbaur's "Manual of Comparative Anatomy"; writes papers for a number of reviews; works at Roscoff at his "Loxosoma" and "Recherches Cotières;" and has a good fight with anti-vivisectionists. In 1879, he comes forward again with a paper on "Archæopteryx"—the second skeleton discovered. In 1884, he publishes his large book on "Mammals," illustrated by Specht; and then sets to work at his "Traité d'Anatomie comparée," with E. Yung's co-operation. A large work, and one that entailed much effort—this treatise was completed only two years ago—it was Vogt's *chant du cygne*, the last work of a very complete and active life, and one which fittingly crowned and closed his career. Carl Vogt was spared the *ante-mortem* death which too often preys upon brain-workers, and kept his mental vigour to the end.

Ever liberal in spirit and in doings, he was to the last the champion of liberal measures and laws, and the protector of the oppressed. Scientific men may regret that he did not devote more time to pure science, but he has so much contributed to ventilate the *quæstiones vexatas* of his time, and to render them intelligible to the general public; he has so liberally devoted much of his time, activity, and talent to the furtherance of measures favourable to the benefit of all, that this regret must cease to exist. Doubtless, he was often excessive in language, and his undisguised materialism made him a large number of enemies. The latter cannot fail, however, to recognise the fact that the life of this "infidel" has been one of which no orthodox man could be ashamed, and that the guiding motives of Carl Vogt's thoughts, writings, and acts were generous and elevated.

M. William Vogt's account of his father's life is most interesting, and we have not been able to do it justice in so short an account. The son has inherited much of his father's wit and hot-headedness; he writes in picturesque and not over-academical style. Some letters of Vogt's correspondents are interspersed here and there: letters from von Baer, Bunsen, de Candolle, Darwin, Gaudry, Herzen, de Quatrefages, Sir John Lubbock, Lyell, &c.; but we much regret that there are not more of those of Carl Vogt himself. The large, powerful, lion-headed naturalist had not only power at his command; wit he had also, and he knew how to use it. The slender and piercing arrow he let fly as dexterously as he wielded the sword or the battle-axe. Many still live who could testify thereto.

HENRY DE VARIGNY.

THE EASTERN TIAN-SHAN.

Description of a Journey to Western China. By G. E. Grum Grzimailo, with the aid of M. E. Grum Grzimailo. Vol. I.: Along the Eastern Tian-Shan. With map and thirty engravings. Edited by the Russian Geographical Society. In Russian. 4to. pp. 320. (St. Petersburg, 1896.)

UNDER the above title the Russian Geographical Society has issued a new addition to its splendid series of works on Central Asia, which already contains the records of the journeys of Prjevalsky, Potanin, and Pyevtsoff. The yet so little-known mountains which are described under the vague name of Eastern Tian-shan, the great desert of the Hashuñ Gobi, and the Nan-shan highlands having been the field of exploration by the brothers Grum Grzimailo during the years 1889 and 1890,